PATENT ABSTRACTS OF JAPAN

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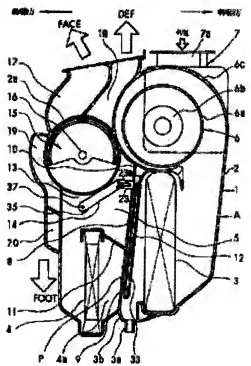
(54) AIR CONDITIONER FOR AUTOMOBILE

(57)Abstract:
PROBLEM TO BE SOLVED: To attain size reduction in an air conditioner for an automobile.
SOLUTION: A sliding door 12 is slidably arranged in a case 2 to form an air passage, and this sliding door 12 is slidingly moved so as to cross an air passage 4a of a heater core 4 and a cold blast passage 5, and an air quantity rate to the heater core 4 and the cold blast passage 5 is adjusted. In the case 2, an air blower 6 is arranged in an upper part of an evaporator 3, and in the case 2, a rotary door 15 is rotatably arranged in an upper part of the heater core 4 on the air downstream side of the heater core 4 and the cold blast passage 5. Plural blowoff air passages 17, 18 and 19 are selectively communicated with each other by this rotary door 15, and blowoff modes are switched to/from each other.



CLAIMS

[Claim(s)]
[Claim 1]Within a case (2) which forms an airstream way, and a condensator (3) which is formed in this case (2) and cools blowing air and said case (2), Within a warmer (4) which heats cold blast which was formed in the air downstream of said condensator (3), and was cooled with this condensator (3), and said case (2), A cool air passage (5) which is provided in parallel with said warmer (4), bypasses said warmer (4), and passes said cold blast, Are slidably provided in said case (2), and it is provided so that it may cross and slide on an air duct (4a) and said cool air passage (5) of said warmer (4), [in said warmer (4), and a sliding type door (12) which adjusts an air quantity rate to said cool air passage (5) and said case (2)], It is provided in said warmer (4) and the air downstream of said cool air passage (5) rotatable, In a rotary system door (15) which has an air opening (150d, 151a) which penetrates circular face-like a peripheral wall part (150c) and this peripheral wall part (150c), and passes air, and said case (2), Carry out an opening to a field which a peripheral wall part (150c) of the shape of a circular face of said rotary system door (15) rotates, and are selectively open for free passage with said air opening (150d, 151a) of said rotary system door (15), An air-conditioner for cars possessing two or more blow-off air ducts (17, 18, 19) which blow off air from said air opening (150d, 151a) to the vehicle interior of a room.
[Claim 2]Said case (2) is arranged at an approximately center part of a vehicle width direction of a vehicle indoor instrument board part, and said condensator (3) within said case (2), It is arranged at the vehicle front side and said warmer (4) within said case (2), It is arranged at the vehicles back side, and said cool air passage (5) is arranged to an upper part part of said warmer (4), and said sliding type door (12), The air-conditioner for cars according to claim 1 crossing an air duct (4a) and said cool air passage (5) of said warmer (4) by sliding on a sliding direction between said condensator (3) and said warmer (4).
[Claim 3]The air-conditioner for cars according to claim 1 or 2, wherein a fan (6) which ventilates air to an upper part part of said condensator (3) in said case (2) at the air upstream of said condensator (3) is arranged.
[Claim 4]In said case (2), to said warmer (4) and an upper part part of said cool air passage (5). An air-conditioner for cars of any one description of the Claims 1-3, wherein said rotary system door (15) is arranged and warm air from said warmer (4) and cold blast from said cool air passage (5) are mixed in said rotary system door (15).
[Claim 5]The air-conditioner for cars according to claim 4, wherein said sliding type door (12) slides on a sliding direction by a drive link mechanism (14) arranged between said rotary system door (15) and said warmer (4).
[Claim 6]A door body (150) in which said rotary system door (15) has a peripheral wall part (150c) of the shape of said circular face, It is provided in the outside surface side of this door body (150),

and comprises a film shaped member (151) which has flexibility, and this film shaped member (151) and said door body (150) are equipped with said air opening (150d, 151a).
An air-conditioner for cars of any one description of the Claims 1-5 with which said film shaped member (151) is characterized by welding by pressure to an edge part of two or more of said blow-off air ducts (17, 18, 19) with a wind pressure of air received through said air opening (150d).

[Claim 7]A support member (21) in which said sliding type door (12) has an opening (24a-24d), A film member (22) which is provided in the air downstream of this support member (21) movable at a support member (21) and one, and has flexibility, It has a guide mechanism (32, 33) which it shows to a motion of said support member (21) so that said support member (21) may be moved to said sliding direction, Said film member (22) with a wind pressure of air received through said opening (24a-24d) of said support member (21). An air-conditioner for cars of any one description of the Claims 1-6 welding by pressure to an air duct opening (9) to said warmer (4), and an edge part of an opening (8) to said cool air passage (5).

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the compact air-conditioner for cars which stored the condensator portion and the warmer portion in one common case.
[0002]
[Description of the Prior Art]While establishing a cool air passage in the warmer which heats blowing air to the air downstream of the condensator which cools blowing air, and this warmer and parallel in JP,H6-71222,U etc. conventionally, The air duct and cool air passage to this warmer are crossed, a sliding type door is provided slidably, and the air-conditioner for cars which adjusts the air quantity rate to a warmer and a cool air passage, and adjusts blowing off air temperature with the sliding position of this sliding type door and which was made to carry out is proposed.
[0003]Conventionally [this], with the device, after mixing the cold blast and warm air to which the air quantity rate was adjusted by the sliding type door, air is blown off to the predetermined blow-off air duct empty vehicle interior of a room where two or more blow-off mode select doors were selected.
[0004]
[Problem(s) to be Solved by the Invention]By the way, since a sliding type door is what slides in the direction which crosses the air duct and cool air passage to a warmer with a device conventionally, Since the blow-off mode switch door was constituted from two or more moving type tabular doors while it had the strong point which can reduce an installing space substantially as compared with the usual moving type tabular door, there was a problem that the installing space of this blow-off mode switch door surely became large.
[0005]So, even if it is possible to store a condensator portion and a warmer portion in one common case, a blower part must be installed as another unit to the exterior of the above-mentioned case. This invention was made in view of the point describing above, and an object of this invention is to provide the air-conditioner for cars to which whole shape including a blow-off mode switch door part can be summarized very compactly.
[0006]
[Means for Solving the Problem]The following technical means are used for this invention in order to attain the above-mentioned purpose. In the invention according to claim 1 to 7, a sliding type door (12) is slidably provided in a case (2) which forms an airstream way, While this sliding type door (12) is slid so that an air duct (4a) and a cool air passage (5) of a warmer (4) may be crossed, and adjusting an air quantity rate to a warmer (4) and a cool air passage (5), In said case (2), provide a rotary system door (15) in a warmer (4) and the air downstream of a cool air passage (5) rotatable, and at this rotary system door (15). In [have an air opening (150d 151a) which penetrates

circular face-like a peripheral wall part (150c) and this peripheral wall part (150c), and passes air, and] said case (2), Two or more blow-off air ducts (17, 18, 19) are provided so that an opening may be carried out to a field which a peripheral wall part (150c) of the shape of a circular face of said rotary system door (15) rotates, Two or more of these blow-off air ducts (17, 18, 19) are made to open for free passage selectively with said air opening (150d, 151a) of said rotary system door (15), and it is characterized by an air-conditioner for cars air from said air opening (150d, 151a) was made to blow off to the vehicle interior of a room.

[0007]Thus, a sliding type door (12) which slides in the direction which crosses an air duct (4a) and a cool air passage (5) of a warmer (4) is used, While a door installing space in both this passage part is reducible, a switching part in blow-off mode can also be constituted using one rotary system door (15), and a door installing space can be reduced remarkably too. As a result, while whole shape including a blow-off mode switch door part of an air conditioning unit can be summarized very compactly and air conditioning unit installation becomes easy also in vehicles with large restrictions of a vehicle indoor space like a minivehicle, A vehicle indoor space can be used effectively by miniaturization of an air conditioning unit for other apparatus installation.

[0008]In the invention according to claim 2, arrange said case (2) in an approximately center part of a vehicle width direction of a vehicle indoor instrument board part, and a condensator (3) within said case (2), It arranges to the vehicle front side, a warmer (4) is arranged to the vehicles back side within said case (2), a cool air passage (5) is arranged to an upper part part of a warmer (4), and it is characterized by sliding a sliding type door (12) on a sliding direction between a condensator (3) and a warmer (4).

[0009]When arranging an air conditioning unit in a vehicle indoor approximately center part, to a vehicles cross direction Therefore, a condensator (3), Also in a minivehicle which it becomes possible to compress these 3 person into a small space, and to station him in order of a sliding type door (12) and a warmer (4), especially a space of a vehicles cross direction cannot secure easily, loading of an air conditioning unit becomes easy every center.

[0010]In the invention according to claim 3, it is characterized by having arranged a fan (6) which ventilates air to an upper part part of a condensator (3) in said case (2) at the air upstream of a condensator (3). An air conditioning unit which united a fan (6) with a condensator (3) portion and a warmer (4) portion can be provided by this, and much more miniaturization of an air conditioning unit and cost reduction by part mark reduction can be planned.

[0011]In the invention according to claim 4, in said case (2), to a warmer (4) and an upper part part of a cool air passage (5). A rotary system door (15) is arranged and it is characterized by mixing warm air from a warmer (4), and cold blast from a cool air passage (5) in a rotary system door (15). Therefore, even if it installs a rotary system door (15), a vehicles cross-direction size of an air conditioning unit hardly increases, but is dramatically advantageous to a miniaturization of an air conditioning unit. And warm air from a warmer (4) and cold blast from a cool air passage (5) can be mixed in a portion of a rotary system door (15), and mixing of cold blast and warm air can be performed good.

[0012]In the invention according to claim 5, it is characterized by sliding on a sliding type door (12) in a sliding direction by a drive link mechanism (14) arranged between a rotary system door (15) and a warmer (4). Therefore, it is not necessary to reduce clearance of a sliding type door (12) and a condensator (3) to necessary minimum, and to build in a link mechanism (14) in a case (2), and to secure an installing space of a link mechanism (14) in the case (2) exterior. As a result, an air conditioning unit can be miniaturized further.

[0013]A door body (150) which has a circular face-like peripheral wall part (150c) for a rotary system door (15) in the invention according to claim 6, It is provided in the outside surface side of this door body (150), and constitutes from a film shaped member (151) which has flexibility, To this

film shaped member (151) and said door body (150), it is an air opening (150 d). It has 151a and a film shaped member (151) is characterized by welding by pressure to an edge part of two or more blow-off air ducts (17, 18, 19) with a wind pressure of air received through an air opening (150d).
[0014]Therefore, a sealing effect by a rotary system door (15) can be enough heightened by carrying out elastic deformation of the flexible film shaped member (151) with a wind pressure, and making it weld by pressure to an edge part of two or more blow-off air ducts (17, 18, 19). A support member (21) which has an opening (24a-24d) at a sliding type door (12) in the invention according to claim 7, A film member (22) which is provided in the air downstream of this support member (21) movable at a support member (21) and one, and has flexibility, It has a guide mechanism (32, 33) which it shows to a motion of a support member (21) so that a support member (21) may be moved to a sliding direction, It is characterized by welding a film member (22) by pressure to an edge part of an air duct opening (9) of a warmer (4), and an opening (8) of said cool air passage (5) with a wind pressure of air received through an opening (24a-24d) of a support member (21).
[0015]Therefore, also in a sliding type door (12), like said rotary system door (15), a film member (22) can be made to be able to weld by pressure to an edge part of double door regio oralis (8, 9) with a wind pressure, and a sealing effect can be heightened enough. Numerals in a parenthesis of each above-mentioned means show a correspondence relation with a concrete means given in an embodiment mentioned later.
[0016]
[Embodiment of the Invention]Hereafter, the embodiment which shows this invention in a figure is described. In drawing 1 and 2, 1 is an air conditioning unit installed in the lower part of a vehicle indoor instrument board among the air-conditioners for cars, and the air conditioning unit 1 is allocated in the approximately center part of a vehicle width direction by this example. This air conditioning unit 1 has the case 2 fabricated by resin, such as polypropylene.
[0017]This case 2 has stored equipments, such as a heat exchanger mentioned later, while forming an airstream way in that inside. The case 2 is divided into the divided case object of plurality (usually two pieces) as everyone knows, and after it stores the below-mentioned equipment, it has structure which combines two or more divided case objects with one in a proper coupling means. 3 is the evaporator allocated in the downward location by the side of the vehicle front in this case 2, and this evaporator 3 constitutes a well-known refrigerating cycle with the compressor, the condenser, receiver, and pressure reducer which are not illustrated, and acts as a condensator which carries out dehumidification cooling of the air in the case 2. The compressor of a refrigerating cycle is driven with an automobile engine via an electromagnetic clutch (not shown).
[0018]4 is the heater core allocated in the downward location by the side of the vehicles back in the case 2, therefore the heater core 4 is allocated in the air downstream of the evaporator 3. This heater core 4 is a warmer which heats air by making the cooling water of an automobile engine into a heat source, and reheats the cold blast cooled with the above-mentioned evaporator 3. The cool air passage 5 through which the cold blast cooled with the evaporator 3 bypasses the heater core 4, and flows into the case 2 is formed in the upper part side part (the upper part side part of the heater core 4) of the air downstream of the evaporator 3. On the other hand, the fan 6 is allocated by the upper part part of the evaporator 3 in the case 2. This fan 6 is a thing of the well-known which has the centrifugal sirocco fan 6a, the motor 6b for a fan drive, and the scroll casing 6c.
[0019]In drawing 1, the air inlet door (not shown) of the fan 6 is installed in the end on the left-hand side of [shaft-orientations] the centrifugal sirocco fan 6a, and air is introduced into this air inlet door via the inside-and-outside mind change box 7. The bashful feed port 7b for this inside-and-outside mind change box 7 being constituted by the case 2 and one, and the outside air introduction port 7a for introducing the open air into that upper edge side carrying out the opening, and introducing vehicle indoor air (bashful) into the slant surface part of the lower part of the

inside-and-outside mind change box 7 is carrying out the opening.

[0020]And the inside-and-outside mind switch door 7c which carries out the change opening and closing of the above-mentioned outside air introduction port 7a and the bashful feed port 7b is installed in the inside of the inside-and-outside mind change box 7 rotatable considering 7 d of axes as a center. On the other hand in the air downstream part of the evaporator 3, within the case 2, to each inlet section of the cool air passage 5 and the passage 4a for heating to the heater core 4. The opening 8 for cold blast for sending the air which passed the evaporator 3 to the cool air passage 5, and the opening 9 for heating for sending the air which passed the evaporator 3 to the passage 4a for heating are formed.

[0021]As shown in drawing 2, the opening of the opening 8 for cold blast and the opening 9 for heating is carried out on the same flat surface P that extends in a sliding direction, and they are constituted by the bridge wall 11 located in the projecting wall part 10 projected from the paries medialis orbitae of the case 2, and the approximately center part in the case 2. And aperture shape is approximately rectangular form and these openings 8 for cold blast and the opening 9 for heating are formed in parallel with a sliding direction, if it sees from the direction of drawing 2 Nakaya seal A.

[0022]The bridge wall 11 is for being formed so that it may extend in the slanting upper part toward the air downstream from the intermediate part of said double door regio oralis 8 and 9, and dividing the cool air passage 5 and the passage 4a for heating. All the air taken in from the opening 9 for heating by the passage 4a for heating by the side of the heater core 4 is sent to the heater core 4 by this. All the air conversely taken in by the cool air passage 5 from the opening 8 for cold blast bypasses the heater core 4.

[0023]By the air downstream of the evaporator 3, the sliding type door 12 which adjusts the air content sent to each of the cool air passage 5 and the passage 4a for heating among the air which passed the evaporator 3 is allocated in the air upstream of the opening 8 for cold blast, and the opening 9 for heating. The details of this sliding type door 12 are mentioned later. The air mix chamber part (mixing space of the coldness-and-warmth style) 13 which mixes the cold blast and warm air which passed through this cool air passage 5 and the passage 4a for heating is formed in the air downstream part of the cool air passage 5 and the passage 4a for heating. The desired degree of air conditioning warm air can be obtained by the cold blast which flows through the cool air passage 5 by this air mix chamber part 13, and the warm air which flows through the passage 4a for heating being mixed.

[0024]And the link mechanism 14 which operates said sliding type door 12 is allocated in the part which results in the above-mentioned air mix chamber part 13 from the cool air passage 5 among the space in the case 2, and the details of this link mechanism 14 are explained in detail like the sliding type door 12 later. The rotary door 15 for a blow-off mode change is allocated in the air mix chamber part 13 located in the case 2 at the upper part side of the heater core 4 rotatable considering the axis 16 as a center. The face blow-off air duct 17, the defroster blow-off air duct 18, and the foot blow-off air duct 19 are formed in the door rotating area by the side of the periphery of this rotary door 15.

[0025]The face blow-off air duct 17 is what is connected to the face outlet (not shown) for blowing off an air conditioning wind toward the upper half of the body of the crew member of the car interior of a room, The defroster blow-off air duct 18 is connected to the defroster outlet (not shown) for blowing off an air conditioning wind toward the inner surface of the windshield of vehicles, and the foot blow-off air duct 19 is connected to the foot outlet 20 for blowing off an air conditioning wind toward a crew member's lower half of the body.

[0026]The details of the rotary door 15 for the above-mentioned blow-off mode change are mentioned later. To the perpendicular line, only a predetermined angle inclines and the flat surface

P in which the above mentioned opening 8 for cold blast and the opening 9 for heating are carrying out the opening is formed. The slope direction of this flat surface P inclines in the direction in which the upper part side of this flat surface P approaches the evaporator 3 side. Therefore, the upper part side is in the state which inclined toward the evaporator 3 side, and the sliding type door 12 is constituted so that it may slide on a sliding direction. Here, as for the angle of gradient of the flat surface P and the sliding type door 12, it is preferred to set it as the range of about 5-30 degrees in consideration of ******** of the water of condensation by which the installing space of the door 12 restrains and it is generated with the evaporator 3.

[0027]In the case 2 of the air conditioning unit 1, the exhaust port 3a which drains the water of condensation by which it is generated with this evaporator 3 is formed in the downward location of the evaporator 3 by integral moulding. And the inclined plane 3b to which it falls toward said exhaust port 3a is established in the case bottom of the downward location of the sliding type door 12 by integral moulding. Next, the above-mentioned sliding type door 12 and the link mechanism 14 are explained in detail. The exploded view of the sliding type door 12 is shown in drawing 3. The group attached chart of the sliding type door 12 is shown in drawing 4. The sliding type door 12 shows drawing 5 the attachment figure attached in the case 2.

[0028]The sliding type door 12 consists of the support member 21 and the film member 22 allocated so that the 1 flat-surface part 21a of the air downstream of this support member 21 may be covered. As for the support member 21, the outside is formed in approximately rectangular form, for example with resin materials, such as polypropylene. And since the four through holes (opening) 24a-24d are formed as shown in drawing 3, the support member 21 presents the shape of a frame like the character of a rice field to the support member 21, and has the cross shape supporter 21b in it.

[0029]The fitting parts 25a and 25b which bent from said 1 flat-surface part 21a to the abbreviated perpendicular direction covering the overall length are really formed in the both ends (both ends before the drawing 3 metacarpus and by the side of the back) of the support member 21. And the cylindrical height 26 of plurality (the example of a graphic display three pieces) projected at equal intervals, respectively is really formed in the outside surface of these fitting parts 25a and 25b. Although these fitting parts 25a and 25b are mentioned later, they are for attaching the film member 22 to the support member 21. These fitting parts 25a and 25b are formed in the upper bed part and lower end part of the sliding type door 12 as shown in drawing 2 and 5.

[0030]On the other hand, it projects in the both-ends side of the support member 21 in the drawing 3 longitudinal direction from this both-ends side, and two or more (two pieces) cylindrical attaching parts 32 for holding the support member 21 movable in the case 2 are really formed in it, respectively. The lever piece 23 which has the engagement groove 23a formed in U shape is formed in the upper surface (field which has attended the cool air passage 5 side in drawing 2) of the supporter 21b of the support member 21. This lever piece 23 is formed so that it may project to the cool air passage 5 side from the 1 flat-surface part 21a of the air downstream of the support member 21, as shown in drawing 3.

[0031]As for the film member 22, it is preferred for there to be flexibility (pliability), and for there to be no breathability and to form with a resin material with small frictional resistance moreover. It specifically consists of a resin film fabricated, for example with 75-micrometer-thick polyethylene terephthalate, and approximately rectangular form is presented. Here, if the size of the film member 22 is described, the width Z of the film member 22 is equivalent to the width W of the support member 21. the size with which height Y of the film member 22, on the other hand, doubled the height X of the support member 21, and the width (twice of the width shown in [V] drawing 3) of the fitting parts 25a and 25b -- the specified quantity -- it is set up greatly.

[0032]Two or more attaching holes 28 are formed in the both ends of the film member 22 at the

same regular intervals as two or more heights 26 formed in the support member 21. The insertion aperture 30 where the above-mentioned lever piece 23 is inserted is formed in the film member 22. The three attaching holes 28 first located in a line with the end side of the film member 22 at equal intervals in such a film member 22 in order to have attached the support member 21 are made to fit into the height 26 by the side of the end of the support member 21 (or loosely fitting). Then, the three attaching holes 28 by the side of the other end are made to fit into the height 26 of an opposite hand, making the lever piece 23 of the support member 21 insert in the insertion aperture 30 (or loosely fitting).

[0033]And hot welding of the film member 22 is carried out to the fitting parts 25a and 25b of the support member 21 by carrying out melting of the height 26, for example with heating apparatus (not shown). Thereby, the film member 22 is fixed to the support member 21. Drawing 4 shows the state after this film member 22 was fixed to the support member 21. And since the width Z of the film member 22 is set as the relation of Z=W to have mentioned above, as shown in drawing 4, both become the same and the width (width shown in [E] drawing 4) of the longitudinal direction of the support member 21 and the film member 22 overlaps exactly. On the other hand, since the size of the film member 22 is larger, drawing 4 Nakagami down height (size shown in [F] drawing 4) will be in the state where the film member 22 bent so that space might be made between the flat-surface part 21a of the support member 21, and the film member 22.

[0034]Here, the mounting structure into the case 2 of the support member 21 and the film member 22 is explained briefly. The case 2 made of resin shown in drawing 2 the case body divided into two on a space side front and the space back side A metal clip, As it is constituted by combining with one by a screw clamp or other means and is shown in the wall of each divided case object of this case 2 at drawing 5, the guide groove 33 of cross-sectional-length hole shape is formed in the sliding direction of the case 2. Although one thing located in the space back side in drawing 2 as this guide groove 33 is shown in drawing 5, two places of this guide groove 33 are actually established in the part to which the wall of each divided case object of the case 2 counters.

[0035]Although the extending direction of that slot is set as the abbreviated perpendicular direction to the air flowing direction which flows through the inside of the case 2, this guide groove 33, Since it is necessary to set up in parallel with the flat surface P in which the opening 8 for cold blast and the opening 9 for heating carried out the opening, this guide groove 33 also inclines that it is also at the same angle of inclination as said flat surface P toward the evaporator 3 side, and is formed. The formation position of this guide groove 33 is the air upstream of the opening 8 for cold blast, and the opening 9 for heating, and is formed near these openings.

[0036]And the attaching part 32 of this support member 21 is inserted into the guide groove 33 of one case body, Furthermore, the attaching part 32 of an opposite hand is inserted into the guide groove 33 of the case body of another side, and as the support member 21 is put by two case bodies, while storing the support member 21 in the case 2 by them, the support member 21 is slidably held to the extending direction of the guide groove 33.

[0037]The air flowing direction and abbreviated perpendicular (if it puts in another way) into which the extending direction of the 1 flat-surface part 21a of the support member 21 flows through the inside of the case 2 in this housed state Arranged so that it may become a direction which crosses an air flow, the support member 21 will always move to the extending direction of this guide groove 33 from the support member 21 moving along the guide groove 33. As shown in drawing 5, it is made to have located the fitting parts 25a and 25b in the both-ends side of the move direction of the support member 21.

[0038]Next, the link mechanism 14 mentioned above is explained in detail based on drawing 5. The link mechanism 14 has the driving shaft 37 in which both ends are supported by the case 2 rotatable, and this driving shaft 37 is formed from resin materials, such as polypropylene. As this

driving shaft 37 is prolonged in the air mix chamber part 13 in the case 2, it is allocated horizontally (vehicle longitudinal direction). The end side of the lever piece 35 is connected with one, and this lever piece 35 is allocated by this driving shaft 37 so that it may extend toward the lever piece 23 side of the support member 21 from the part of the driving shaft 37. The cylindrical engagement part 36 is really formed in the other end side of this lever piece 35, and this engagement part 36 engages with the engagement groove 23a of the lever piece 23 of the support member 21 rotatable.
[0039]Within the case 2, as the one end side (left-hand side of drawing 5) of the driving shaft 37 does not project to the exterior, it is supported by the case wall side rotatable, but the other end side is projected to the exterior of the case 2, and the driving lever 27 as a driving means which drives this driving shaft 37 is connected. By the above composition, it is made to follow on rotating the driving shaft 37, the lever piece 35 also rotates to one, and the position of the engagement part 36 of the lever piece 35 moves to the sliding direction of drawing 5. By movement of this engagement part 36, the support member 21 moves to the sliding direction (abbreviation to the air flowing direction which flows through the inside of the case 2 vertical direction) of drawing 5 along the guide groove 33 in response to the power of a sliding direction via the lever piece 23. .
[0040]From what the manual operation force added to the manual operation lever (control lever for temperature control) of the air-conditioning-control panel (not shown) which a well-known thing may be sufficient as the drive mechanism of the above mentioned driving lever 27, and is provided in a vehicle indoor instrument board part is transmitted to the driving lever 27 for via a control cable. It is considered as the mechanism in which the driving lever 27 is rotated. Or it may be made to rotate the driving lever 27 with actuators, such as a servo motor by which Automatic Control Division is carried out with the control device for air conditioning.
[0041]Next, drawing 6 - drawing 9 explain the details of the rotary system door 15 for a blow-off mode change. This rotary system door 15 possesses the rotary door main part 150 and the film member 151, and is constituted. among these, as the rotary door main part 150 consists of resin materials, for example and it is shown in drawing 6 thru/or drawing 8, it has mostly the end plate parts 150a and 150b of semicircular shapes and the peripheral wall part 150c which makes the shape of a circular face of two sheets in one -- so to speak, it is making the semicircle tubed of vertical division.
[0042]It is located in the center of curvature of the circle of the peripheral wall part 150c at said end plate parts 150a and 150b, and the axes 16 and 16 which project in an axial outside are formed in one. And as shown in drawing 8 etc., the four slender openings 150d are mostly formed in shaft orientations at equal intervals along with the hoop direction at said peripheral wall part 150c. Now, the peripheral wall part 150c has a long and slender rib prolonged in shaft orientations in two places of hoop direction both ends, and 3 between each opening 150d, and is made into the gestalt in which almost all the remaining portions carried out the opening.
[0043]As shown in drawing 6, integral moulding of the fitting parts 150e and 150e for extending in the inside diameter side from the rim side part of the hoop direction both ends of the peripheral wall part 150c, and attaching the film member 151 mentioned later is carried out to the rotary door main part 150. As a part is shown in drawing 6 and drawing 8, some 150f of projections and 150 g of fitting holes are really formed in these fitting parts 150e and 150e.
[0044]On the other hand, the film member 151 is the same as the film member 22 of the sliding type door 12, has flexibility (pliability), does not have breathability, and, moreover, is fabricated with the resin material with small frictional resistance. Specifically, the film member 151 consists of a resin film fabricated with 75-micrometer-thick polyethylene terephthalate. And the film member 151 is formed in rectangular shape as the whole which has the width dimension M almost equivalent to the axial dimension of the peripheral wall part 150c of said rotary door main part 150, as shown in drawing 9.

[0045]And along with the direction of width M, two or more fresh air inlets 151a are formed in the part in the middle of the direction of length L of this film member 151. In this example, each fresh air inlet 151a is formed in about 6 rectangular shape. Two or more holes 151b for attachment are formed in the both-ends portion (rim side part of right and left [drawing 9]) of the direction of length L of this film member 151, respectively. Specifically as this hole 151b for attachment, the circular hole which fits into 150 f of projections of said fitting part 150e, and the long hole which carries out a lap to said 150 g of fitting holes then are formed by turns.
[0046]Although this film member 151 is formed in the surface part of the peripheral wall part 150c of said rotary door main part 150, As shown in drawing 6, drawing 8, etc., at this time in the outside surface of the peripheral wall part 150c. It is located in the long and slender rib parts prolonged in shaft orientations two places of hoop direction both ends, and 3 (a total of five places) between each opening 150d, and for example, it is long and slender to shaft orientations, the elastic member 152 which consists of urethane foam is formed by adhesion.
[0047]The film pressure plates 153 and 153 shown in drawing 6, drawing 8, etc. in this case for attachment of the film member 151 are used. This film pressure plate 153 is fabricated with the resin material by the long and slender thin plate state corresponding to said fitting part 150e, It has the composition of having by turns the fitting claw 153a which fits into 150 g of fitting holes of said fitting part 150e in the ****** state at the plate surface, and the circular hole 153b which fits into said 150 f of projections.
[0048]In attaching the film member 151 to the rotary door main part 150, First, as the peripheral part of the peripheral wall part 150c of the rotary door main part 150 is covered from the upper part, the both ends of the film member 151 are bent to the inside diameter side, and the hole 151b (circular hole) for attachment is made to fit into 150 f of projections of the fitting part 150e of the door body 150, respectively, as shown in drawing 8.
[0049]And in this state, as are shown in drawing 6 etc., and the fitting claw 153a of the film pressure plate 153 is inserted in 150 g of fitting holes of the fitting part 150e through the hole 151b (long hole) for attachment, the film pressure plate 153 is attached. Now, the film member 151 is fixed to the state where it faced across the both ends between the fitting part 150e and the film pressure plate 153.
[0050]At this time, linear dimension L (refer to drawing 9) of said film member 151, It comprises a little length which added the folding part for attachment of both ends to the virtual hoop direction length which the peripheral face of said elastic member 152 forms for a long time, Now, the film member 151 is held at curved shape which meets the periphery of the peripheral wall part 150c of the rotary door main part 150 by the elastic member 152, and it is provided in the state where some sag was consisted.
[0051]The fresh air inlet 151a of the film member 151, As shown in drawing 6 among the four openings 150d of the rotary door main part 150, a lap is carried out to the opening 150d located in the 2nd from a hoop direction left edge part at clockwise direction, and the inside-and-outside periphery of the rotary door main part 150 is opened for traffic in this fresh air inlet 150d portion. As the shank 16 of the rotary door main part 150 constituted as mentioned above of both-ends Itabe 150a and 150b corresponds with the center of curvature of the case [where said each air duct parts 17, 18, and 19 shown in drawing 2 are located in a line] 2 side circular face 2a (refer to drawing 2), it is supported by the wall of the case 2 pivotable.
[0052]At this time, as shown in drawing 2 and below-mentioned drawing 10, the peripheral wall part 150c of the rotary door main part 150 counters each air duct parts 17, 18, and 19, The virtual circular face which the peripheral face of the elastic member 152 forms is set up consist a minute crevice (for example, about 0.5 mm) between the edge parts of each air duct parts 17, 18, and 19. And the lever which is not illustrated adheres to one side of said shank 16, and it is connected by

one end of the control cable which is not illustrated at the end of this lever, and the other end side of this control cable, It is connected to the switching control means slack blow-off mode switching lever (not shown) provided in in the car, and, thereby, the rotary door main part 150 is displaced based on operation of a blow-off mode switching lever to a hand of cut (they are arrow ** and the ** direction at drawing 10).

[0053]Next, the operation of this embodiment is explained in the composition mentioned above. Now, if the fan 6 is operated, according to the actuated valve position of the inside-and-outside mind change box 7 to the inside-and-outside mind switch door 7c, or the open air will be inhaled, and it will be ventilated by the evaporator 3 through the fan 6, it will be cooled here, and this suction air will serve as cold blast. Subsequently, this cold blast branches and flows into the passage 4a for heating, and the cool air passage 5 according to the slide position (actuated valve position of a sliding direction) of the sliding type door 12, and the cold blast which flowed into the passage 4a for heating is reheated by the heater core 4, and turns into warm air. And the warm air from this passage 4a for heating and the cold blast from the cool air passage 5, It is mixed in the air mix chamber part 13 and rotary system door 15 portion, and becomes the style [desired temperature] of air conditioning, and the appropriate back blows off to the vehicle interior of a room through any one or the plurality of the blow-off air ducts 17-19 selected at the rotary system door 15.

[0054]Since the above is an outline of an operation of the whole air-conditioner next, the blow-off mode switching action by the rotary system door 15 and the blowing off air temperature control action by the sliding type door 12 are explained in full detail. First, if a blow-off mode switching action is described, it will follow on the operation of the fan 2 as mentioned above, Blowing air (mixture air of cold blast and warm air) results [from the air mix chamber part 13] in the inner circumference side of the rotary door main part 150, It results in each outlet in each blow-off air duct part 17 - 19 empty vehicles through the fresh air inlet 151a of the film member 151 which carries out a lap to the 2nd opening 150d of the peripheral wall part 150c of the rotary door main part 150, and it. And at this time, the film member 151 is projected so that it may swell to the periphery side with a wind pressure, and it is welded by pressure to the edge part of the air duct parts 17-19 which should be blockaded, and a seal is carried out.

[0055]According to this embodiment, when a user operates a blow-off mode switching lever in the car, the operating physical force is directly transmitted to the rotary door main part 150 via a control cable and a lever, and the rotary door main part 150 is displaced in arrow [of drawing 10] **, or the ** direction. At this time, the rotary door main part 150 is specifically displaced in each position shown in drawing 10, and either of the five blow-off modes is chosen.

[0056]Namely, when "FACE mode" is chosen by the blow-off mode switching lever. As shown in drawing 10 (a), the fresh air inlet 151a of the film member 151 carries out a lap to the air duct part 17 for faces, and the air in the door body 150 blows off from the outlet for faces in the car toward a crew member's upper half of the body through the air duct part 17 for faces, as arrow ** shows. At this time, by projecting so that it may swell to the periphery side with a wind pressure, the film member 151 is welded by pressure to the edge part of other air duct parts 18 and 19, and certainly without wind leakage blockades these air duct parts 18 and 19.

[0057]Drawing 10 (b) is shown and the situation at the time of a "bilevel mode" being chosen here, Ranging over a part of air duct part 19 for feet, and some both sides of the air duct part 17 for faces, the fresh air inlet 151a of the film member 151 carries out a lap, and the air in the door body 150, As arrow ** and ** show, it blows off from the both sides of the outlet 20 (refer to drawing 2) for feet, and the outlet for faces toward a crew member's upper half of the body and step part through both the air duct parts 17 and 19.

[0058]At this time, the film member 151 is welded by pressure to the edge part of the air duct part

18 for defrosters, and blockades this. Drawing 10 (c) shows the situation at the time of a "FOOT mode" being chosen, the fresh air inlet 151a carries out a lap to the air duct part 19 for feet, and the air in the door body 150 blows off from the outlet 20 for feet toward a crew member's step part through the air duct part 19 for feet, as arrow ** shows. At this time, the film member 151 blockades other air duct parts 17 and 18.

[0059]Drawing 10 (d) shows the situation at the time of "FOOT/DEF mode" being chosen, and the fresh air inlet 151a carries out a lap to the part of the air duct part 19 for feet, and. The end of the rotary door main part 150 is located in the pars intermedia of the air duct part 18 for defrosters, and opens the air duct part 18 for defrosters. The air which has flowed toward the door body 150 now blows off from the both sides of the outlet 20 for feet, and the outlet for defrosters through both the air duct parts 18 and 19, as arrow ** and ** show. At this time, the film member 151 is welded by pressure to the edge part of the air duct part 17 for faces, and blockades this.

[0060]Drawing 10 (e) shows the situation at the time of a "DEF mode" being chosen. Since the rotary door main part 150 will be in the state where it evacuated in the arrow ** direction from air duct part 18 portion for defrosters, in this state and 18 copies of air duct parts for defrosters are opened fully, The air which has flowed toward the door body 150 blows off from the outlet for defrosters through the air duct part 18 for defrosters, as arrow ** shows. At this time, the film member 151 is welded by pressure to the edge part of the air duct part 19 for feet, and the air duct part 17 for faces, and blockades them.

[0061]Thus, since according to this embodiment it constituted so that two or more blow-off air duct parts 17, 18, and 19 might be opened and closed by the rotation displacement of the one rotary door main part 150, simplification of the drive mechanism for displacing the composition of a blow-off mode switching part and it can be attained. In this case, since the film member 151 was constituted from a member of one sheet which especially has the fresh air inlet 151a at this embodiment, Since it constituted so that film member 151 the very thing and its mounting structure may also become easy and the rotary door main part 150 might be further displaced directly with the control cable connected to the blow-off mode switching lever, Rotation displacement of the rotary door main part 150 can be certainly carried out with very easy composition.

[0062]And when the film member 151 provided in the surface part of the rotary door main part 150 welds by pressure to the edge part of the blow-off air duct parts 17, 18, and 19 with a wind pressure and carries out a seal, Since it was made to blockade the blow-off air duct parts 17, 18, and 19, the film member 151 can be stuck to the edge part of the blow-off air duct parts 17, 18, and 19, and the sealing effect of wind leak prevention is high.

[0063]It is ****** to suppress generating of a sliding sound, while frictional force is small, a sliding friction can be made small and an operating physical force ends small, since it is the composition of making the film member 151 welding by pressure by a wind pressure. Since the elastic member 152 is allocated between the peripheral wall part 150c of the rotary door main part 150, and the film member 151, The shape of the film member 151 can be held to the curved shape in alignment with the peripheral wall part 150c, and the film member 151 can be held good, without slackening greatly or lenticulating.

[0064]Next, when the blowing off air temperature control action by the sliding type door 12 is explained, First, the state which shows in drawing 2 is in a Max hot state (the maximum heating state), and the support member 21 and the film member 22 of the sliding type door 12 are most located up in this state. The sliding type door 12 opens the opening 9 for heating fully with this actuated position, and full close of the opening 8 for cold blast is carried out. As a result, all the cold blast cooled by passing the evaporator 3 is sent to the heater core 4. The shape of the film member 22 in this state is typically shown in drawing 11 and drawing 12.

[0065]Drawing 11 shows the state of the film member 22 at the time of a fan stop, and drawing 12 expresses the state of the film member 22 at the time of a fan operation. As shown in drawing 11, at the time of a fan stop, the film member 22 maintains natural shape and a crevice with some exists between the edge part 38 of the opening 8 for cold blast, and the film member 22. However, in [as shown in drawing 12] the time of a fan operation, The air (drawing 12 Nakaya seal D) which passed the evaporator 3 passes through the through holes 24a-24d of the support member 21, and is sprayed on the inner surface of the film member 22, it bends so that the film member 22 may swell leftward in drawing 12 with this wind pressure, and it welds by pressure over the perimeter of the edge part 38 of the opening 8 for cold blast.

[0066]Thereby, the opening 8 for cold blast is certainly blockaded by the film member 22, and the sealing effect of a blockade can be heightened enough. So, all the cold blast it was lost that air begins to leak from the opening 8 for cold blast at the time of Max hot, and passed the evaporator 3 will be ventilated from the opening 9 for heating by the passage 4a for heating.

[0067]Next, the sliding type door 12 explains the time of the exhaust air mix by which the air which passed the evaporator 3 is sent to the both sides of the cool air passage 5 and the passage 4a for heating (at the time of intermediate-temperature control) based on drawing 13. In this case, the support member 21 and the film member 22 of the sliding type door 12, The desired degree of air conditioning warm air is obtained by being mostly located in pars intermedia, adjusting the rate of the effective area product of the opening 8 for cold blast, and the opening 9 for heating, and mixing the air of the sliding direction in the case 2 which passed these double door regio oralis 8 and 9 by the air mix chamber part 13, as shown in drawing 13.

[0068]Here, if the air taken in from the opening 8 for cold blast leaks from between the partitioning part 11 and the film members 22 and enters a broth and the passage 4a for heating, the problem that the desired mixing ratio is not obtained arises. If the air conversely taken in from the opening 9 for heating leaks from between the partitioning part 11 and the film members 22 and enters a broth and the cool air passage 5, the problem that the desired mixing ratio is not obtained too will arise.

[0069]The air which passed the evaporator 3 in this embodiment however, via the through holes 24a-24d, Since the film member 22 is sprayed, it bends so that the film member 22 may swell to the partitioning part 11 side and the film member 22 welds by pressure to the end face of the partitioning part 11 with a wind pressure, generating of the above-mentioned problem can be prevented certainly. Therefore, by the film member 22, the effective area product of the cool air passage 5 and the passage 4a for heating can be adjusted, and the desired degree of air conditioning warm air can be obtained. .

[0070]Next, the time of the Max period of treatment (the maximum cooling condition) shown in drawing 14 is explained. In order that the support member 21 of the sliding type door 12 may be in the state where it is located caudad, and the state which shows in drawing 14 may carry out full close of the opening 9 for heating and may open the opening 8 for cold blast fully, all the air that passed the evaporator 3 is sent to the cool air passage 5. Since the state of the film member 22 at the time of this Max period of treatment is the same as that of the time of above-mentioned Max hot, explanation is omitted.

[0071]being the direction as a monotonous extending direction with the plate-like support member 21 and the film member 22 of the sliding type door 12 same like the above, and receiving the air flowing direction in the case 2 -- abbreviated -- by moving in the vertical direction, It becomes possible to make small the working space of the support member 21 and the film member 22. Specifically compared with the air mix door of a moving type like before, it becomes possible to shorten substantially width of the longitudinal direction in drawing 2 (vehicles cross direction).

[0072]and the space from the cool air passage 5 in the case 2 to the air mix chamber part 13 for the link mechanism 14 which operates the support member 21, if it puts in another way, Since it is

installing between the heater core 4 and the rotary system door 15, the clearance of the support member 21 and the evaporator 3 is reducible to necessary minimum. Since the link mechanism 14 is built in in the case 2, it is not necessary to secure the installing space of the link mechanism 14 in the case 2 exterior. As a result, the physique of the air-conditioner for vehicles can be substantially made small.

[0073]A seal can be certainly carried out by sagging the film member 22 with a wind pressure, and making it weld by pressure to the edge part 38 and the bridge wall 11. Since the seal is carried out by the wind pressure in this case, it becomes more possible than making it slide, making it weld by pressure by packing etc. for example reducing the operating physical force of the support member 21 far. Though the support member 21 and the film member 22 are moved in every direction in order that the support member 21 and the film member 22 may move to an air flowing direction and an abbreviated perpendicular, a wind pressure does not cause the increase in an operating physical force.

(Other embodiments) In addition, this invention can also consist of two or more resin films, without the resin film of one sheet constituting [in / it is feasible, for example, / the rotary system door 15] the film member 151 from various gestalten like the above-mentioned example, without being limited to the embodiment mentioned above.

[0074]Means, such as a rivet, a screw stop, adhesion, can be adopted without considering it as a projection [like the above-mentioned example] whose mounting structure of the film member 151 is also, and the fitting structure of a hole. The rotary door main part 150 can also use the thing of various shape, such as not only a semicircle tubed thing but a thing of all the cylindrical shape. Of course, the operation machine style of the rotary system door 15 and the sliding type door 12 can also use the operation machine style using actuators, such as a servo motor instead of a manual operation system.

[Translation done.]

TECHNICAL FIELD

[Field of the Invention]This invention relates to the compact air-conditioner for cars which stored the condensator portion and the warmer portion in one common case.

[Translation done.]

PRIOR ART

[Description of the Prior Art]While establishing a cool air passage in the warmer which heats blowing air to the air downstream of the condensator which cools blowing air, and this warmer and parallel in JP,H6-71222,U etc. conventionally, The air duct and cool air passage to this warmer are crossed, a sliding type door is provided slidably, and the air-conditioner for cars which adjusts the air quantity rate to a warmer and a cool air passage, and adjusts blowing off air temperature with the sliding position of this sliding type door and which was made to carry out is proposed.
[0003]Conventionally [this], with the device, after mixing the cold blast and warm air to which the air quantity rate was adjusted by the sliding type door, air is blown off to the predetermined blow-off air duct empty vehicle interior of a room where two or more blow-off mode select doors were selected.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]By the way, since a sliding type door is what slides in the direction which crosses the air duct and cool air passage to a warmer with a device conventionally, Since the blow-off mode switch door was constituted from two or more moving type tabular doors while it had the strong point which can reduce an installing space substantially as compared with the usual moving type tabular door, there was a problem that the installing space of this blow-off mode switch door surely became large.
[0005]So, even if it is possible to store a condensator portion and a warmer portion in one common case, a blower part must be installed as another unit to the exterior of the above-mentioned case. This invention was made in view of the point describing above, and an object of this invention is to provide the air-conditioner for cars to which whole shape including a blow-off mode switch door part can be summarized very compactly.

[Translation done.]

MEANS

[Means for Solving the Problem]The following technical means are used for this invention in order to attain the above-mentioned purpose. In the invention according to claim 1 to 7, a sliding type door (12) is slidably provided in a case (2) which forms an airstream way, While this sliding type door (12) is slid so that an air duct (4a) and a cool air passage (5) of a warmer (4) may be crossed, and adjusting an air quantity rate to a warmer (4) and a cool air passage (5), In said case (2), provide a rotary system door (15) in a warmer (4) and the air downstream of a cool air passage (5) rotatable, and at this rotary system door (15). In [have an air opening (150d 151a) which penetrates circular face-like a peripheral wall part (150c) and this peripheral wall part (150c), and passes air, and] said case (2), Two or more blow-off air ducts (17, 18, 19) are provided so that an opening may be carried out to a field which a peripheral wall part (150c) of the shape of a circular face of said rotary system door (15) rotates, Two or more of these blow-off air ducts (17, 18, 19) are made to open for free passage selectively with said air opening (150d, 151a) of said rotary system door (15), and it is characterized by an air-conditioner for cars air from said air opening (150d, 151a) was made to blow off to the vehicle interior of a room.

[0007]Thus, a sliding type door (12) which slides in the direction which crosses an air duct (4a) and a cool air passage (5) of a warmer (4) is used, While a door installing space in both this passage part is reducible, a switching part in blow-off mode can also be constituted using one rotary system door (15), and a door installing space can be reduced remarkably too. As a result, while whole shape including a blow-off mode switch door part of an air conditioning unit can be summarized very compactly and air conditioning unit installation becomes easy also in vehicles with large restrictions of a vehicle indoor space like a minivehicle, A vehicle indoor space can be used effectively by miniaturization of an air conditioning unit for other apparatus installation.

[0008]In the invention according to claim 2, arrange said case (2) in an approximately center part of a vehicle width direction of a vehicle indoor instrument board part, and a condensator (3) within said case (2), It arranges to the vehicle front side, a warmer (4) is arranged to the vehicles back side within said case (2), a cool air passage (5) is arranged to an upper part part of a warmer (4), and it is characterized by sliding a sliding type door (12) on a sliding direction between a condensator (3) and a warmer (4).

[0009]When arranging an air conditioning unit in a vehicle indoor approximately center part, to a vehicles cross direction Therefore, a condensator (3), Also in a minivehicle which it becomes possible to compress these 3 person into a small space, and to station him in order of a sliding type door (12) and a warmer (4), especially a space of a vehicles cross direction cannot secure easily, loading of an air conditioning unit becomes easy every center.

[0010]In the invention according to claim 3, it is characterized by having arranged a fan (6) which ventilates air to an upper part part of a condensator (3) in said case (2) at the air upstream of a

condensator (3). An air conditioning unit which united a fan (6) with a condensator (3) portion and a warmer (4) portion can be provided by this, and much more miniaturization of an air conditioning unit and cost reduction by part mark reduction can be planned.

[0011]In the invention according to claim 4, in said case (2), to a warmer (4) and an upper part part of a cool air passage (5). A rotary system door (15) is arranged and it is characterized by mixing warm air from a warmer (4), and cold blast from a cool air passage (5) in a rotary system door (15). Therefore, even if it installs a rotary system door (15), a vehicles cross-direction size of an air conditioning unit hardly increases, but is dramatically advantageous to a miniaturization of an air conditioning unit. And warm air from a warmer (4) and cold blast from a cool air passage (5) can be mixed in a portion of a rotary system door (15), and mixing of cold blast and warm air can be performed good.

[0012]In the invention according to claim 5, it is characterized by sliding on a sliding type door (12) in a sliding direction by a drive link mechanism (14) arranged between a rotary system door (15) and a warmer (4). Therefore, it is not necessary to reduce clearance of a sliding type door (12) and a condensator (3) to necessary minimum, and to build in a link mechanism (14) in a case (2), and to secure an installing space of a link mechanism (14) in the case (2) exterior. As a result, an air conditioning unit can be miniaturized further.

[0013]A door body (150) which has a circular face-like peripheral wall part (150c) for a rotary system door (15) in the invention according to claim 6, It is provided in the outside surface side of this door body (150), and constitutes from a film shaped member (151) which has flexibility, To this film shaped member (151) and said door body (150), it is an air opening (150 d). It has 151a and a film shaped member (151) is characterized by welding by pressure to an edge part of two or more blow-off air ducts (17, 18, 19) with a wind pressure of air received through an air opening (150d).

[0014]Therefore, a sealing effect by a rotary system door (15) can be enough heightened by carrying out elastic deformation of the flexible film shaped member (151) with a wind pressure, and making it weld by pressure to an edge part of two or more blow-off air ducts (17, 18, 19). A support member (21) which has an opening (24a-24d) at a sliding type door (12) in the invention according to claim 7, A film member (22) which is provided in the air downstream of this support member (21) movable at a support member (21) and one, and has flexibility, It has a guide mechanism (32, 33) which it shows to a motion of a support member (21) so that a support member (21) may be moved to a sliding direction, It is characterized by welding a film member (22) by pressure to an edge part of an air duct opening (9) of a warmer (4), and an opening (8) of said cool air passage (5) with a wind pressure of air received through an opening (24a-24d) of a support member (21).

[0015]Therefore, also in a sliding type door (12), like said rotary system door (15), a film member (22) can be made to be able to weld by pressure to an edge part of double door regio oralis (8, 9) with a wind pressure, and a sealing effect can be heightened enough. Numerals in a parenthesis of each above-mentioned means show a correspondence relation with a concrete means given in an embodiment mentioned later.

[0016]

[Embodiment of the Invention]Hereafter, the embodiment which shows this invention in a figure is described. In drawing 1 and 2, 1 is an air conditioning unit installed in the lower part of a vehicle indoor instrument board among the air-conditioners for cars, and the air conditioning unit 1 is allocated in the approximately center part of a vehicle width direction by this example. This air conditioning unit 1 has the case 2 fabricated by resin, such as polypropylene.

[0017]This case 2 has stored equipments, such as a heat exchanger mentioned later, while forming an airstream way in that inside. The case 2 is divided into the divided case object of plurality (usually two pieces) as everyone knows, and after it stores the below-mentioned equipment, it has structure which combines two or more divided case objects with one in a proper coupling means. 3

is the evaporator allocated in the downward location by the side of the vehicle front in this case 2, and this evaporator 3 constitutes a well-known refrigerating cycle with the compressor, the condenser, receiver, and pressure reducer which are not illustrated, and acts as a condensator which carries out dehumidification cooling of the air in the case 2. The compressor of a refrigerating cycle is driven with an automobile engine via an electromagnetic clutch (not shown).

[0018]4 is the heater core allocated in the downward location by the side of the vehicles back in the case 2, therefore the heater core 4 is allocated in the air downstream of the evaporator 3. This heater core 4 is a warmer which heats air by making the cooling water of an automobile engine into a heat source, and reheats the cold blast cooled with the above-mentioned evaporator 3. The cool air passage 5 through which the cold blast cooled with the evaporator 3 bypasses the heater core 4, and flows into the case 2 is formed in the upper part side part (the upper part side part of the heater core 4) of the air downstream of the evaporator 3. On the other hand, the fan 6 is allocated by the upper part part of the evaporator 3 in the case 2. This fan 6 is a thing of the well-known which has the centrifugal sirocco fan 6a, the motor 6b for a fan drive, and the scroll casing 6c.

[0019]In drawing 1, the air inlet door (not shown) of the fan 6 is installed in the end on the left-hand side of [shaft-orientations] the centrifugal sirocco fan 6a, and air is introduced into this air inlet door via the inside-and-outside mind change box 7. The bashful feed port 7b for this inside-and-outside mind change box 7 being constituted by the case 2 and one, and the outside air introduction port 7a for introducing the open air into that upper edge side carrying out the opening, and introducing vehicle indoor air (bashful) into the slant surface part of the lower part of the inside-and-outside mind change box 7 is carrying out the opening.

[0020]And the inside-and-outside mind switch door 7c which carries out the change opening and closing of the above-mentioned outside air introduction port 7a and the bashful feed port 7b is installed in the inside of the inside-and-outside mind change box 7 rotatable considering 7 d of axes as a center. On the other hand in the air downstream part of the evaporator 3, within the case 2, to each inlet section of the cool air passage 5 and the passage 4a for heating to the heater core 4. The opening 8 for cold blast for sending the air which passed the evaporator 3 to the cool air passage 5, and the opening 9 for heating for sending the air which passed the evaporator 3 to the passage 4a for heating are formed.

[0021]As shown in drawing 2, the opening of the opening 8 for cold blast and the opening 9 for heating is carried out on the same flat surface P that extends in a sliding direction, and they are constituted by the bridge wall 11 located in the projecting wall part 10 projected from the paries medialis orbitae of the case 2, and the approximately center part in the case 2. And aperture shape is approximately rectangular form and these openings 8 for cold blast and the opening 9 for heating are formed in parallel with a sliding direction, if it sees from the direction of drawing 2 Nakaya seal A.

[0022]The bridge wall 11 is for being formed so that it may extend in the slanting upper part toward the air downstream from the intermediate part of said double door regio oralis 8 and 9, and dividing the cool air passage 5 and the passage 4a for heating. All the air taken in from the opening 9 for heating by the passage 4a for heating by the side of the heater core 4 is sent to the heater core 4 by this. All the air conversely taken in by the cool air passage 5 from the opening 8 for cold blast bypasses the heater core 4.

[0023]By the air downstream of the evaporator 3, the sliding type door 12 which adjusts the air content sent to each of the cool air passage 5 and the passage 4a for heating among the air which passed the evaporator 3 is allocated in the air upstream of the opening 8 for cold blast, and the opening 9 for heating. The details of this sliding type door 12 are mentioned later. The air mix chamber part (mixing space of the coldness-and-warmth style) 13 which mixes the cold blast and warm air which passed through this cool air passage 5 and the passage 4a for heating is formed in

the air downstream part of the cool air passage 5 and the passage 4a for heating. The desired degree of air conditioning warm air can be obtained by the cold blast which flows through the cool air passage 5 by this air mix chamber part 13, and the warm air which flows through the passage 4a for heating being mixed.

[0024]And the link mechanism 14 which operates said sliding type door 12 is allocated in the part which results in the above-mentioned air mix chamber part 13 from the cool air passage 5 among the space in the case 2, and the details of this link mechanism 14 are explained in detail like the sliding type door 12 later. The rotary door 15 for a blow-off mode change is allocated in the air mix chamber part 13 located in the case 2 at the upper part side of the heater core 4 rotatable considering the axis 16 as a center. The face blow-off air duct 17, the defroster blow-off air duct 18, and the foot blow-off air duct 19 are formed in the door rotating area by the side of the periphery of this rotary door 15.

[0025]The face blow-off air duct 17 is what is connected to the face outlet (not shown) for blowing off an air conditioning wind toward the upper half of the body of the crew member of the car interior of a room, The defroster blow-off air duct 18 is connected to the defroster outlet (not shown) for blowing off an air conditioning wind toward the inner surface of the windshield of vehicles, and the foot blow-off air duct 19 is connected to the foot outlet 20 for blowing off an air conditioning wind toward a crew member's lower half of the body.

[0026]The details of the rotary door 15 for the above-mentioned blow-off mode change are mentioned later. To the perpendicular line, only a predetermined angle inclines and the flat surface P in which the above mentioned opening 8 for cold blast and the opening 9 for heating are carrying out the opening is formed. The slope direction of this flat surface P inclines in the direction in which the upper part side of this flat surface P approaches the evaporator 3 side. Therefore, the upper part side is in the state which inclined toward the evaporator 3 side, and the sliding type door 12 is constituted so that it may slide on a sliding direction. Here, as for the angle of gradient of the flat surface P and the sliding type door 12, it is preferred to set it as the range of about 5-30 degrees in consideration of ******** of the water of condensation by which the installing space of the door 12 restrains and it is generated with the evaporator 3.

[0027]In the case 2 of the air conditioning unit 1, the exhaust port 3a which drains the water of condensation by which it is generated with this evaporator 3 is formed in the downward location of the evaporator 3 by integral moulding. And the inclined plane 3b to which it falls toward said exhaust port 3a is established in the case bottom of the downward location of the sliding type door 12 by integral moulding. Next, the above-mentioned sliding type door 12 and the link mechanism 14 are explained in detail. The exploded view of the sliding type door 12 is shown in drawing 3. The group attached chart of the sliding type door 12 is shown in drawing 4. The sliding type door 12 shows drawing 5 the attachment figure attached in the case 2.

[0028]The sliding type door 12 consists of the support member 21 and the film member 22 allocated so that the 1 flat-surface part 21a of the air downstream of this support member 21 may be covered. As for the support member 21, the outside is formed in approximately rectangular form, for example with resin materials, such as polypropylene. And since the four through holes (opening) 24a-24d are formed as shown in drawing 3, the support member 21 presents the shape of a frame like the character of a rice field to the support member 21, and has the cross shape supporter 21b in it.

[0029]The fitting parts 25a and 25b which bent from said 1 flat-surface part 21a to the abbreviated perpendicular direction covering the overall length are really formed in the both ends (both ends before the drawing 3 metacarpus and by the side of the back) of the support member 21. And the cylindrical height 26 of plurality (the example of a graphic display three pieces) projected at equal intervals, respectively is really formed in the outside surface of these fitting parts 25a and 25b.

Although these fitting parts 25a and 25b are mentioned later, they are for attaching the film member 22 to the support member 21. These fitting parts 25a and 25b are formed in the upper bed part and lower end part of the sliding type door 12 as shown in drawing 2 and 5.

[0030]On the other hand, it projects in the both-ends side of the support member 21 in the drawing 3 longitudinal direction from this both-ends side, and two or more (two pieces) cylindrical attaching parts 32 for holding the support member 21 movable in the case 2 are really formed in it, respectively. The lever piece 23 which has the engagement groove 23a formed in U shape is formed in the upper surface (field which has attended the cool air passage 5 side in drawing 2) of the supporter 21b of the support member 21. This lever piece 23 is formed so that it may project to the cool air passage 5 side from the 1 flat-surface part 21a of the air downstream of the support member 21, as shown in drawing 3.

[0031]As for the film member 22, it is preferred for there to be flexibility (pliability), and for there to be no breathability and to form with a resin material with small frictional resistance moreover. It specifically consists of a resin film fabricated, for example with 75-micrometer-thick polyethylene terephthalate, and approximately rectangular form is presented. Here, if the size of the film member 22 is described, the width Z of the film member 22 is equivalent to the width W of the support member 21. the size with which height Y of the film member 22, on the other hand, doubled the height X of the support member 21, and the width (twice of the width shown in [V] drawing 3) of the fitting parts 25a and 25b — the specified quantity -- it is set up greatly.

[0032]Two or more attaching holes 28 are formed in the both ends of the film member 22 at the same regular intervals as two or more heights 26 formed in the support member 21. The insertion aperture 30 where the above-mentioned lever piece 23 is inserted is formed in the film member 22. The three attaching holes 28 first located in a line with the end side of the film member 22 at equal intervals in such a film member 22 in order to have attached the support member 21 are made to fit into the height 26 by the side of the end of the support member 21 (or loosely fitting). Then, the three attaching holes 28 by the side of the other end are made to fit into the height 26 of an opposite hand, making the lever piece 23 of the support member 21 insert in the insertion aperture 30 (or loosely fitting).

[0033]And hot welding of the film member 22 is carried out to the fitting parts 25a and 25b of the support member 21 by carrying out melting of the height 26, for example with heating apparatus (not shown). Thereby, the film member 22 is fixed to the support member 21. Drawing 4 shows the state after this film member 22 was fixed to the support member 21. And since the width Z of the film member 22 is set as the relation of Z=W to have mentioned above, as shown in drawing 4, both become the same and the width (width shown in [E] drawing 4) of the longitudinal direction of the support member 21 and the film member 22 overlaps exactly. On the other hand, since the size of the film member 22 is larger, drawing 4 Nakagami down height (size shown in [F] drawing 4) will be in the state where the film member 22 bent so that space might be made between the flat-surface part 21a of the support member 21, and the film member 22.

[0034]Here, the mounting structure into the case 2 of the support member 21 and the film member 22 is explained briefly. The case 2 made of resin shown in drawing 2 the case body divided into two on a space side front and the space back side A metal clip, As it is constituted by combining with one by a screw clamp or other means and is shown in the wall of each divided case object of this case 2 at drawing 5, the guide groove 33 of cross-sectional-length hole shape is formed in the sliding direction of the case 2. Although one thing located in the space back side in drawing 2 as this guide groove 33 is shown in drawing 5, two places of this guide groove 33 are actually established in the part to which the wall of each divided case object of the case 2 counters.

[0035]Although the extending direction of that slot is set as the abbreviated perpendicular direction to the air flowing direction which flows through the inside of the case 2, this guide groove 33, Since

it is necessary to set up in parallel with the flat surface P in which the opening 8 for cold blast and the opening 9 for heating carried out the opening, this guide groove 33 also inclines that it is also at the same angle of inclination as said flat surface P toward the evaporator 3 side, and is formed. The formation position of this guide groove 33 is the air upstream of the opening 8 for cold blast, and the opening 9 for heating, and is formed near these openings.

[0036]And the attaching part 32 of this support member 21 is inserted into the guide groove 33 of one case body, Furthermore, the attaching part 32 of an opposite hand is inserted into the guide groove 33 of the case body of another side, and as the support member 21 is put by two case bodies, while storing the support member 21 in the case 2 by them, the support member 21 is slidably held to the extending direction of the guide groove 33.

[0037]The air flowing direction and abbreviated perpendicular (if it puts in another way) into which the extending direction of the 1 flat-surface part 21a of the support member 21 flows through the inside of the case 2 in this housed state Arranged so that it may become a direction which crosses an air flow, the support member 21 will always move to the extending direction of this guide groove 33 from the support member 21 moving along the guide groove 33. As shown in drawing 5, it is made to have located the fitting parts 25a and 25b in the both-ends side cf the move direction of the support member 21.

[0038]Next, the link mechanism 14 mentioned above is explained in detail based on drawing 5. The link mechanism 14 has the driving shaft 37 in which both ends are supported by the case 2 rotatable, and this driving shaft 37 is formed from resin materials, such as polypropylene. As this driving shaft 37 is prolonged in the air mix chamber part 13 in the case 2, it is allocated horizontally (vehicle longitudinal direction). The end side of the lever piece 35 is connected with one, and this lever piece 35 is allocated by this driving shaft 37 so that it may extend toward the lever piece 23 side of the support member 21 from the part of the driving shaft 37. The cylindrical engagement part 36 is really formed in the other end side of this lever piece 35, and this engagement part 36 engages with the engagement groove 23a of the lever piece 23 of the support member 21 rotatable.

[0039]Within the case 2, as the one end side (left-hand side of drawing 5) of the driving shaft 37 does not project to the exterior, it is supported by the case wall side rotatable, but the other end side is projected to the exterior of the case 2, and the driving lever 27 as a driving means which drives this driving shaft 37 is connected. By the above composition, it is made to follow on rotating the driving shaft 37, the lever piece 35 also rotates to one, and the position of the engagement part 36 of the lever piece 35 moves to the sliding direction of drawing 5. By movement of this engagement part 36, the support member 21 moves to the sliding direction (abbreviation to the air flowing direction which flows through the inside of the case 2 vertical direction) of drawing 5 along the guide groove 33 in response to the power of a sliding direction via the lever piece 23. .

[0040]From what the manual operation force added to the manual operation lever (control lever for temperature control) of the air-conditioning-control panel (not shown) which a well-known thing may be sufficient as the drive mechanism of the above mentioned driving lever 27, and is provided in a vehicle indoor instrument board part is transmitted to the driving lever 27 for via a control cable. It is considered as the mechanism in which the driving lever 27 is rotated. Or it may be made to rotate the driving lever 27 with actuators, such as a servo motor by which Automatic Control Division is carried out with the control device for air conditioning.

[0041]Next, drawing 6 - drawing 9 explain the details of the rotary system door 15 for a blow-off mode change. This rotary system door 15 possesses the rotary door main part 150 and the film member 151, and is constituted. among these, as the rotary door main part 150 consists of resin materials, for example and it is shown in drawing 6 thru/or drawing 8, it has mostly the end plate parts 150a and 150b of semicircular shapes and the peripheral wall part 150c which makes the shape of a circular face of two sheets in one — so to speak, it is making the semicircle tubed of

vertical division.

[0042]It is located in the center of curvature of the circle of the peripheral wall part 150c at said end plate parts 150a and 150b, and the axes 16 and 16 which project in an axial outside are formed in one. And as shown in drawing 8 etc., the four slender openings 150d are mostly formed in shaft orientations at equal intervals along with the hoop direction at said peripheral wall part 150c. Now, the peripheral wall part 150c has a long and slender rib prolonged in shaft orientations in two places of hoop direction both ends, and 3 between each opening 150d, and is made into the gestalt in which almost all the remaining portions carried out the opening.

[0043]As shown in drawing 6, integral moulding of the fitting parts 150e and 150e for extending in the inside diameter side from the rim side part of the hoop direction both ends of the peripheral wall part 150c, and attaching the film member 151 mentioned later is carried out to the rotary door main part 150. As a part is shown in drawing 6 and drawing 8, some 150f of projections and 150 g of fitting holes are really formed in these fitting parts 150e and 150e.

[0044]On the other hand, the film member 151 is the same as the film member 22 of the sliding type door 12, has flexibility (pliability), does not have breathability, and, moreover, is fabricated with the resin material with small frictional resistance. Specifically, the film member 151 consists of a resin film fabricated with 75-micrometer-thick polyethylene terephthalate. And the film member 151 is formed in rectangular shape as the whole which has the width dimension M almost equivalent to the axial dimension of the peripheral wall part 150c of said rotary door main part 150, as shown in drawing 9.

[0045]And along with the direction of width M, two or more fresh air inlets 151a are formed in the part in the middle of the direction of length L of this film member 151. In this example, each fresh air inlet 151a is formed in about 6 rectangular shape. Two or more holes 151b for attachment are formed in the both-ends portion (rim side part of right and left [drawing 9]) of the direction of length L of this film member 151, respectively. Specifically as this hole 151b for attachment, the circular hole which fits into 150 f of projections of said fitting part 150e, and the long hole which carries out a lap to said 150 g of fitting holes then are formed by turns.

[0046]Although this film member 151 is formed in the surface part of the peripheral wall part 150c of said rotary door main part 150, As shown in drawing 6, drawing 8, etc., at this time in the outside surface of the peripheral wall part 150c. It is located in the long and slender rib parts prolonged in shaft orientations two places of hoop direction both ends, and 3 (a total of five places) between each opening 150d, and for example, it is long and slender to shaft orientations, the elastic member 152 which consists of urethane foam is formed by adhesion.

[0047]The film pressure plates 153 and 153 shown in drawing 6, drawing 8, etc. in this case for attachment of the film member 151 are used. This film pressure plate 153 is fabricated with the resin material by the long and slender thin plate state corresponding to said fitting part 150e, It has the composition of having by turns the fitting claw 153a which fits into 150 g of fitting holes of said fitting part 150e in the ****** state at the plate surface, and the circular hole 153b which fits into said 150 f of projections.

[0048]In attaching the film member 151 to the rotary door main part 150, First, as the peripheral part of the peripheral wall part 150c of the rotary door main part 150 is covered from the upper part, the both ends of the film member 151 are bent to the inside diameter side, and the hole 151b (circular hole) for attachment is made to fit into 150 f of projections of the fitting part 150e of the door body 150, respectively, as shown in drawing 8.

[0049]And in this state, as are shown in drawing 6 etc., and the fitting claw 153a of the film pressure plate 153 is inserted in 150 g of fitting holes of the fitting part 150e through the hole 151b (long hole) for attachment, the film pressure plate 153 is attached. Now, the film member 151 is fixed to the state where it faced across the both ends between the fitting part 150e and the film

pressure plate 153.

[0050]At this time, linear dimension L (refer to drawing 9) of said film member 151, It comprises a little length which added the folding part for attachment of both ends to the virtual hoop direction length which the peripheral face of said elastic member 152 forms for a long time, Now, the film member 151 is held at curved shape which meets the periphery of the peripheral wall part 150c of the rotary door main part 150 by the elastic member 152, and it is provided in the state where some sag was consisted.

[0051]The fresh air inlet 151a of the film member 151, As shown in drawing 6 among the four openings 150d of the rotary door main part 150, a lap is carried out to the opening 150d located in the 2nd from a hoop direction left edge part at clockwise direction, and the inside-and-outside periphery of the rotary door main part 150 is opened for traffic in this fresh air inlet 150d portion. As the shank 16 of the rotary door main part 150 constituted as mentioned above of both-ends Itabe 150a and 150b corresponds with the center of curvature of the case [where said each air duct parts 17, 18, and 19 shown in drawing 2 are located in a line] 2 side circular face 2a (refer to drawing 2), it is supported by the wall of the case 2 pivotable.

[0052]At this time, as shown in drawing 2 and below-mentioned drawing 10, the peripheral wall part 150c of the rotary door main part 150 counters each air duct parts 17, 18, and 19, The virtual circular face which the peripheral face of the elastic member 152 forms is set up consist a minute crevice (for example, about 0.5 mm) between the edge parts of each air duct parts 17, 18, and 19. And the lever which is not illustrated adheres to one side of said shank 16, and it is connected by one end of the control cable which is not illustrated at the end of this lever, and the other end side of this control cable, It is connected to the switching control means slack blow-off mode switching lever (not shown) provided in in the car, and, thereby, the rotary door main part 150 is displaced based on operation of a blow-off mode switching lever to a hand of cut (they are arrow ** and the ** direction at drawing 10).

[0053]Next, the operation of this embodiment is explained in the composition mentioned above. Now, if the fan 6 is operated, according to the actuated valve position of the inside-and-outside mind change box 7 to the inside-and-outside mind switch door 7c, or the open air will be inhaled, and it will be ventilated by the evaporator 3 through the fan 6, it will be cooled here, and this suction air will serve as cold blast. Subsequently, this cold blast branches and flows into the passage 4a for heating, and the cool air passage 5 according to the slide position (actuated valve position of a sliding direction) of the sliding type door 12, and the cold blast which flowed into the passage 4a for heating is reheated by the heater core 4, and turns into warm air. And the warm air from this passage 4a for heating and the cold blast from the cool air passage 5, It is mixed in the air mix chamber part 13 and rotary system door 15 portion, and becomes the style [desired temperature] of air conditioning, and the appropriate back blows off to the vehicle interior of a room through any one or the plurality of the blow-off air ducts 17-19 selected at the rotary system door 15.

[0054]Since the above is an outline of an operation of the whole air-conditioner next, the blow-off mode switching action by the rotary system door 15 and the blowing off air temperature control action by the sliding type door 12 are explained in full detail. First, if a blow-off mode switching action is described, it will follow on the operation of the fan 2 as mentioned above, Blowing air (mixture air of cold blast and warm air) results [from the air mix chamber part 13] in the inner circumference side of the rotary door main part 150, It results in each outlet in each blow-off air duct part 17 - 19 empty vehicles through the fresh air inlet 151a of the film member 151 which carries out a lap to the 2nd opening 150d of the peripheral wall part 150c of the rotary door main part 150, and it. And at this time, the film member 151 is projected so that it may swell to the periphery side with a wind pressure, and it is welded by pressure to the edge part of the air duct

parts 17-19 which should be blockaded, and a seal is carried out.

[0055]According to this embodiment, when a user operates a blow-off mode switching lever in the car, the operating physical force is directly transmitted to the rotary door main part 150 via a control cable and a lever, and the rotary door main part 150 is displaced in arrow [of drawing 10] **, or the ** direction. At this time, the rotary door main part 150 is specifically displaced in each position shown in drawing 10, and either of the five blow-off modes is chosen.

[0056]Namely, when "FACE mode" is chosen by the blow-off mode switching lever. As shown in drawing 10 (a), the fresh air inlet 151a of the film member 151 carries out a lap to the air duct part 17 for faces, and the air in the door body 150 blows off from the outlet for faces in the car toward a crew member's upper half of the body through the air duct part 17 for faces, as arrow ** shows. At this time, by projecting so that it may swell to the periphery side with a wind pressure, the film member 151 is welded by pressure to the edge part of other air duct parts 18 and 19, and certainly without wind leakage blockades these air duct parts 18 and 19.

[0057]Drawing 10 (b) is shown and the situation at the time of a "bilevel mode" being chosen here, Ranging over a part of air duct part 19 for feet, and some both sides of the air duct part 17 for faces, the fresh air inlet 151a of the film member 151 carries out a lap, and the air in the door body 150, As arrow ** and ** show, it blows off from the both sides of the outlet 20 (refer to drawing 2) for feet, and the outlet for faces toward a crew member's upper half of the body and step part through both the air duct parts 17 and 19.

[0058]At this time, the film member 151 is welded by pressure to the edge part of the air duct part 18 for defrosters, and blockades this. Drawing 10 (c) shows the situation at the time of a "FOOT mode" being chosen, the fresh air inlet 151a carries out a lap to the air duct part 19 for feet, and the air in the door body 150 blows off from the outlet 20 for feet toward a crew member's step part through the air duct part 19 for feet, as arrow ** shows. At this time, the film member 151 blockades other air duct parts 17 and 18.

[0059]Drawing 10 (d) shows the situation at the time of "FOOT/DEF mode" being chosen, and the fresh air inlet 151a carries out a lap to the part of the air duct part 19 for feet, and. The end of the rotary door main part 150 is located in the pars intermedia of the air duct part 18 for defrosters, and opens the air duct part 18 for defrosters. The air which has flowed toward the door body 150 now blows off from the both sides of the outlet 20 for feet, and the outlet for defrosters through both the air duct parts 18 and 19, as arrow ** and ** show. At this time, the film member 151 is welded by pressure to the edge part of the air duct part 17 for faces, and blockades this.

[0060]Drawing 10 (e) shows the situation at the time of a "DEF mode" being chosen. Since the rotary door main part 150 will be in the state where it evacuated in the arrow ** direction from air duct part 18 portion for defrosters, in this state and 18 copies of air duct parts for defrosters are opened fully, The air which has flowed toward the door body 150 blows off from the outlet for defrosters through the air duct part 18 for defrosters, as arrow ** shows. At this time, the film member 151 is welded by pressure to the edge part of the air duct part 19 for feet, and the air duct part 17 for faces, and blockades them.

[0061]Thus, since according to this embodiment it constituted so that two or more blow-off air duct parts 17, 18, and 19 might be opened and closed by the rotation displacement of the one rotary door main part 150, simplification of the drive mechanism for displacing the composition of a blow-off mode switching part and it can be attained. In this case, since the film member 151 was constituted from a member of one sheet which especially has the fresh air inlet 151a at this embodiment, Since it constituted so that film member 151 the very thing and its mounting structure may also become easy and the rotary door main part 150 might be further displaced directly with the control cable connected to the blow-off mode switching lever, Rotation displacement of the rotary door main part 150 can be certainly carried out with very easy

composition.

[0062]And when the film member 151 provided in the surface part of the rotary door main part 150 welds by pressure to the edge part of the blow-off air duct parts 17, 18, and 19 with a wind pressure and carries out a seal, Since it was made to blockade the blow-off air duct parts 17, 18, and 19, the film member 151 can be stuck to the edge part of the blow-off air duct parts 17, 18, and 19, and the sealing effect of wind leak prevention is high.

[0063]It is ****** to suppress generating of a sliding sound, while frictional force is small, a sliding friction can be made small and an operating physical force ends small, since it is the composition of making the film member 151 welding by pressure by a wind pressure. Since the elastic member 152 is allocated between the peripheral wall part 150c of the rotary door main part 150, and the film member 151, The shape of the film member 151 can be held to the curved shape in alignment with the peripheral wall part 150c, and the film member 151 can be held good, without slackening greatly or lenticulating.

[0064]Next, when the blowing off air temperature control action by the sliding type door 12 is explained, First, the state which shows in drawing 2 is in a Max hot state (the maximum heating state), and the support member 21 and the film member 22 of the sliding type door 12 are most located up in this state. The sliding type door 12 opens the opening 9 for heating fully with this actuated position, and full close of the opening 8 for cold blast is carried out. As a result, all the cold blast cooled by passing the evaporator 3 is sent to the heater core 4. The shape of the film member 22 in this state is typically shown in drawing 11 and drawing 12.

[0065]Drawing 11 shows the state of the film member 22 at the time of a fan stop, and drawing 12 expresses the state of the film member 22 at the time of a fan operation. As shown in drawing 11, at the time of a fan stop, the film member 22 maintains natural shape and a crevice with some exists between the edge part 38 of the opening 8 for cold blast, and the film member 22. However, in [as shown in drawing 12] the time of a fan operation, The air (drawing 12 Nakaya seal D) which passed the evaporator 3 passes through the through holes 24a-24d of the support member 21, and is sprayed on the inner surface of the film member 22, it bends so that the film member 22 may swell leftward in drawing 12 with this wind pressure, and it welds by pressure over the perimeter of the edge part 38 of the opening 8 for cold blast.

[0066]Thereby, the opening 8 for cold blast is certainly blockaded by the film member 22, and the sealing effect of a blockade can be heightened enough. So, all the cold blast it was lost that air begins to leak from the opening 8 for cold blast at the time of Max hot, and passed the evaporator 3 will be ventilated from the opening 9 for heating by the passage 4a for heating.

[0067]Next, the sliding type door 12 explains the time of the exhaust air mix by which the air which passed the evaporator 3 is sent to the both sides of the cool air passage 5 and the passage 4a for heating (at the time of intermediate-temperature control) based on drawing 13. In this case, the support member 21 and the film member 22 of the sliding type door 12, The desired degree of air conditioning warm air is obtained by being mostly located in pars intermedia, adjusting the rate of the effective area product of the opening 8 for cold blast, and the opening 9 for heating, and mixing the air of the sliding direction in the case 2 which passed these double door regio oralis 8 and 9 by the air mix chamber part 13, as shown in drawing 13.

[0068]Here, if the air taken in from the opening 8 for cold blast leaks from between the partitioning part 11 and the film members 22 and enters a broth and the passage 4a for heating, the problem that the desired mixing ratio is not obtained arises. If the air conversely taken in from the opening 9 for heating leaks from between the partitioning part 11 and the film members 22 and enters a broth and the cool air passage 5, the problem that the desired mixing ratio is not obtained too will arise.

[0069]The air which passed the evaporator 3 in this embodiment however, via the through holes 24a-24d, Since the film member 22 is sprayed, it bends so that the film member 22 may swell to

the partitioning part 11 side and the film member 22 welds by pressure to the end face of the partitioning part 11 with a wind pressure, generating of the above-mentioned problem can be prevented certainly. Therefore, by the film member 22, the effective area product of the cool air passage 5 and the passage 4a for heating can be adjusted, and the desired degree of air conditioning warm air can be obtained. .

[0070]Next, the time of the Max period of treatment (the maximum cooling condition) shown in drawing 14 is explained. In order that the support member 21 of the sliding type door 12 may be in the state where it is located caudad, and the state which shows in drawing 14 may carry out full close of the opening 9 for heating and may open the opening 8 for cold blast fully, all the air that passed the evaporator 3 is sent to the cool air passage 5. Since the state of the film member 22 at the time of this Max period of treatment is the same as that of the time of above-mentioned Max hot, explanation is omitted.

[0071]being the direction as a monotonous extending direction with the plate-like support member 21 and the film member 22 of the sliding type door 12 same like the above, and receiving the air flowing direction in the case 2 -- abbreviated -- by moving in the vertical direction, It becomes possible to make small the working space of the support member 21 and the film member 22. Specifically compared with the air mix door of a moving type like before, it becomes possible to shorten substantially width of the longitudinal direction in drawing 2 (vehicles cross direction).

[0072]and the space from the cool air passage 5 in the case 2 to the air mix chamber part 13 for the link mechanism 14 which operates the support member 21, if it puts in another way, Since it is installing between the heater core 4 and the rotary system door 15, the clearance of the support member 21 and the evaporator 3 is reducible to necessary minimum. Since the link mechanism 14 is built in in the case 2, it is not necessary to secure the installing space of the link mechanism 14 in the case 2 exterior. As a result, the physique of the air-conditioner for vehicles can be substantially made small.

[0073]A seal can be certainly carried out by sagging the film member 22 with a wind pressure, and making it weld by pressure to the edge part 38 and the bridge wall 11. Since the seal is carried out by the wind pressure in this case, it becomes more possible than making it slide, making it weld by pressure by packing etc. for example reducing the operating physical force of the support member 21 far. Though the support member 21 and the film member 22 are moved in every direction in order that the support member 21 and the film member 22 may move to an air flowing direction and an abbreviated perpendicular, a wind pressure does not cause the increase in an operating physical force.

(Other embodiments) In addition, this invention can also consist of two or more resin films, without the resin film of one sheet constituting [in / it is feasible, for example, / the rotary system door 15] the film member 151 from various gestalten like the above-mentioned example, without being limited to the embodiment mentioned above.

[0074]Means, such as a rivet, a screw stop, adhesion, can be adopted without considering it as a projection [like the above-mentioned example] whose mounting structure of the film member 151 is also, and the fitting structure of a hole. The rotary door main part 150 can also use the thing of various shape, such as not only a semicircle tubed thing but a thing of all the cylindrical shape. Of course, the operation machine style of the rotary system door 15 and the sliding type door 12 can also use the operation machine style using actuators, such as a servo motor instead of a manual operation system.

[Translation done.]

* NOTICES *

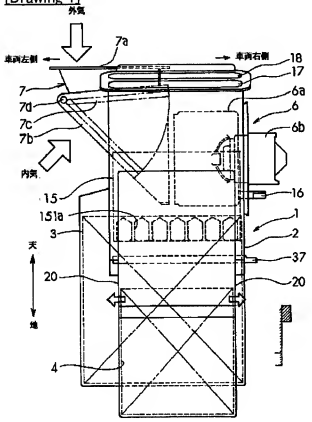
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a front view showing one embodiment of this invention device.
[Drawing 2]The outline composition sectional view in one embodiment of this invention device shows the state at the time of Max hot.
[Drawing 3]It is an exploded perspective view of the support member and film member in the sliding type door shown in drawing 2.
[Drawing 4]It is a perspective view of the state with a group of the support member and film member which are shown in drawing 3.
[Drawing 5]It is a perspective view showing the storing-and-holding state within the case of a sliding type door.
[Drawing 6]It is drawing of longitudinal section of the rotary system door part shown in drawing 2.
[Drawing 7]It is a front view of the rotary system door part shown in drawing 2.
[Drawing 8]It is an exploded perspective view of the rotary system door part shown in drawing 2.
[Drawing 9]It is a top view before attachment of the film member of the rotary system door shown in drawing 2.
[Drawing 10]It is an important section sectional view explaining the blow-off mode switching action by a rotary system door.
[Drawing 11]It is an important section sectional view showing the state at the time of a fan stop of the film member of a sliding type door.
[Drawing 12]It is an important section sectional view showing the state at the time of the fan operation of the film member of a sliding type door.
[Drawing 13]The same outline composition sectional view as drawing 2 shows the state at the time of an exhaust air mix.
[Drawing 14]Drawing 2 and the same outline composition sectional view as 13 show the state at the time of the Max period of treatment.
[Description of Notations]
1 [-- A heater core, 5 / -- Cool air passage,] -- An air conditioning unit, 2 -- A case, 3 -- An evaporator, 4 12 [-- A rotary system door, 17, 18, 19 / -- A blow-off air duct, 21 / -- A support member, 22 / -- A film member, 150 / -- A rotary door main part, 151 / -- Film member.] -- A sliding type door, 13 -- An air mix chamber part, 14 -- A link mechanism, 15

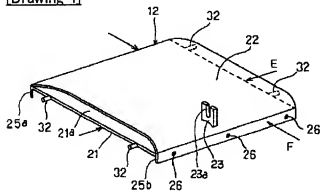
[Translation done.]

DRAWINGS

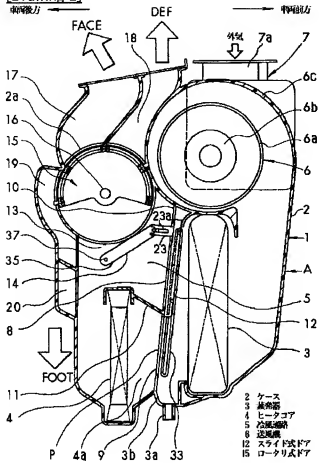
[Drawing 1]



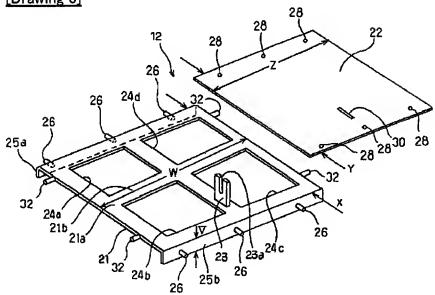
[Drawing 4]



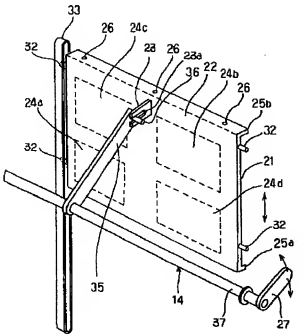
[Drawing 2]



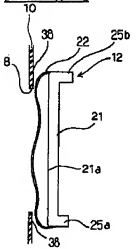
[Drawing 3]



[Drawing 5]



[Drawing 11]



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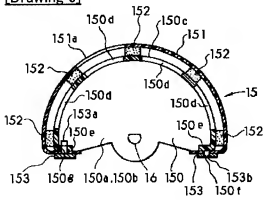
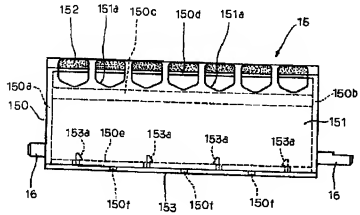
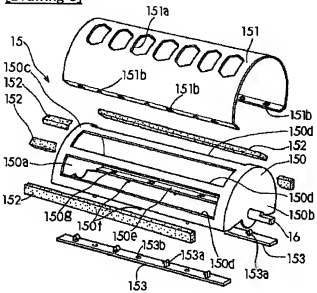


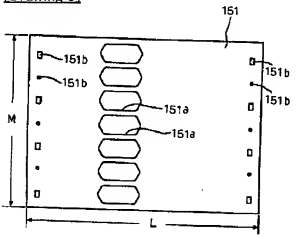
[Drawing 7]



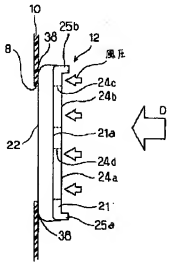
[Drawing 8]



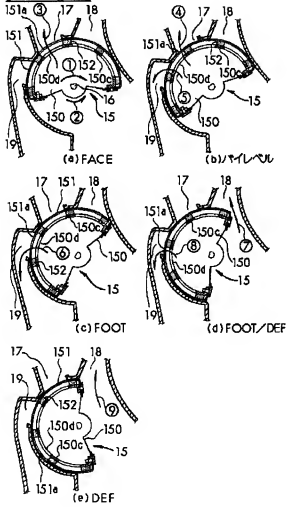
[Drawing 9]



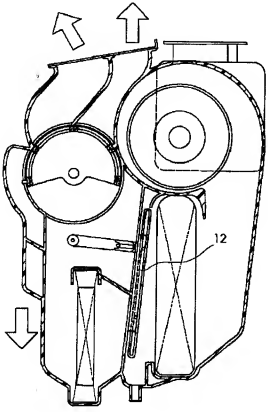
[Drawing 12]



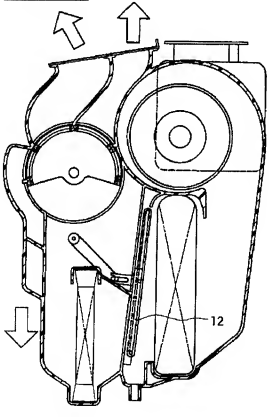
[Drawing 10]



[Drawing 13]



[Drawing 14]



[Translation done.]